REMARKS

Applicants appreciate the thorough examination of the application that is reflected in the final Office Action dated June 2, 2004.

Applicants amend claims 18, 19, 21, 22, 24, 25, 29, 33, 36, 37, 39, 40, 42, 43, 47, 49 and 50.

Applicants rewrite claims 29 and 47 in independent form. Accordingly, Applicants submit that claims 29 and 47 are in condition for allowance.

Applicants amend claims 18, 19, 21, 24, 33, 36, 37, 39, 42, 49 and 50 to correct typographical errors.

Applicants cancel claims 26-27 and 44-45 without prejudice or disclaimer.

Applicants believe the foregoing amendments comply with requirements of form and thus may be entered under 37 C.F.R. § 1.116(a) as presenting rejected claims in better from for consideration on appeal. Alternatively, to the extent any of these amendments are deemed to touch the merits, entry is requested under 37 C.F.R. § 1.116(b). These amendments were not presented earlier because they are in response to the matters pointed out for the first time in the final Office Action.

Claims 1-25, 28-43, and 46-50 are pending in the application. Applicants respectfully request reconsideration of this application.

Rejections Under 35 U.S.C. §112, First Paragraph

The Office rejects claims 19 and 37 under 35 U.S.C. §112, first paragraph as allegedly containing subject matter which was not described in the specification. Applicants submit that claims 19 and 37 are supported throughout the drawings and specification. For example, see page 12, lines 6-14 of the specification describing that:

> "The best base stations in the alternative embodiment may be pre-selected. The pre-selection may be based on criteria other than QPCH message reception or the pilot signal being above the threshold 510. For example, the mobile station may remain in approximately the same geographical areas in a low mobility situation. Therefore, the number of base stations surrounding the mobile station may remain constant. In this situation, the mobile station may wake up periodically based on an internal timing control to monitor the paging channel. If

there is a paging message, the mobile station monitors the signals from all the pre-identified base stations." (Emphasis added.)

Accordingly, Applicants submit that the rejection of claims 19 and 37 under 35 U.S.C. §112, first paragraph was improper. Nevertheless, to broaden the claims, Applicants amend claims 19 and 37 to require that the terminal chooses "the paging channel to monitor based on a pre-selected order among the origination stations." Claims 19 and 37 were not rejected based on art. Accordingly, Applicants submit that claims 19 and 37 are in condition for allowance.

The Office rejects claims 23 and 41 under 35 U.S.C. §112, first paragraph as allegedly containing subject matter which was not described in the specification. Applicants submit that claims 23 and 41 are supported throughout the drawings and specification. See, for example, page 7, lines 3-4, page 10, lines 14-16, page 11, lines 22-24 of the specification, and page 12, lines 13-14 of the specification which is reproduced above. Accordingly, Applicants submit that the rejection of claims 23 and 41 under 35 U.S.C. §112, first paragraph was improper since the terminal monitoring "a subset of the paging channels for their regular page messages by recording the signals for a period during which an regular page would exist" was described in the specification.

The Office rejects claims 21, 24, 39, and 42 under 35 U.S.C. §112, first paragraph as allegedly containing subject matter which was not described in the specification. Applicants submit that claims 21, 24, 39, and 42 are supported throughout the drawings and specification, for example, see page 12, lines 2-3 of the specification describing that "the signals from different base stations may be sampled and stored for a serial combining and decoding process." (Emphasis added.) Accordingly, Applicants submit that the rejection of claims 21, 24, 39, and 42 under 35 U.S.C. §112, first paragraph was improper since the terminal serially processing "the signals to receive the possible page on different paging channels" was described in the specification.

The Office rejects claims 22, 25, 40, and 43 under 35 U.S.C. §112, first paragraph as allegedly containing subject matter which was not described in the specification. Applicants amend claims 22, 25, 40 and 43 to clarify those claims to recite that "the respective quick paging channel messages are transmitted at substantially the same time from each of the origination

stations." Applicants submit that amended claims 22, 25, 40, and 43 are supported throughout the drawings and specification, for example, see page 11, lines 5-24 of the specification describing that:

> "In a synchronized system, QPCH message 521 may be transmitted by different base stations at substantially the same time. Considering the propagation delay and other factors, QPCH message 521 may also be received at the mobile station substantially at the same time. As a result, the paging message 522 following QCPH message 521 is also transmitted from different base stations at substantially the same time, and received at substantially the same time. Note that, at the time of paging message 522, the base station associated with the pilot signal 501 may not be the best base station. If the mobile station limits the paging message detection to only the best base station as detected during the QPCH 521, the mobile station may fail to properly decode the paging message.
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> In order to solve the problem associated with the changes in the channel between the transmission time of the QPCH message 521 and the paging message 522, the mobile station tracks more than one base station as the best base station." (Emphasis added.)

Accordingly, Applicants submit that the rejection of claims 22, 25, 40, and 43 under 35 U.S.C. §112, first paragraph is moot since "the respective quick paging channel messages are transmitted at substantially the same time from each of the origination stations" was described in the specification.

Applicants cancel claims 26 and 44 without prejudice or disclaimer. Accordingly, this cancellation renders the rejection moot.

Summary of Selected Embodiments

In discussing Fig. 3 which shows a flow chart illustrating the operation of the demodulator of Fig. 2 during idle mode, page 6, lines 1-35 of the specification discusses that:

> At step **306**, searcher **206** is switched to demodulation mode, and the paging channel associated with each signal detected during search mode is demodulated to determine if a quick page has been received. The quick pages are processed by performing coherent demodulation on the set of paging channels corresponding to the set of pilot channels detected during searching. Thus, in one embodiment of the invention, the quick page channel is demodulated within the searcher after the searching is performed. Each demodulation is performed at a particular offset within the samples, and the resulting set of demodulation soft decision data is diversity combined using an accumulator within searcher **206**.
>
> At step **308** the combined demodulation data is examined to determine if a positive quick page has been received (i.e., one indicating that the following full

paging message may be directed to the particular subscriber unit). If a positive quick page has not been received, the subscriber unit returns to step **300**. If a positive quick page has been received, the finger elements **208,** decoder **214** and RF/IF unit **190** are activated at step **310**, and the full page processed at step **312**. In an alternative embodiment of the invention, the subscriber unit continues to search the samples for other pilots to find new signals to process when the next paging slot occurs. Additionally, if the quick paging channel was not received with sufficient quality, then step **310** is performed anyway to ensure that a full-page message is not missed.

By performing both the searching and quick page processing within searcher unit **206**, the quick paging channel can be monitored without having to activate finger elements until a positive quick page is received. Generally, most quick page messages will be negative, indicating that no call or message is pending. Thus, the time the finger elements **208** and other circuitry are activated is significantly reduced. Therefore, reducing the circuitry used to perform quick page channel monitoring increases the standby time of the subscriber unit.

This reduction in circuitry is accomplished by taking advantage of the reduced coding level of the quick paging channel and quick page message and storing received samples for processing. The reduced coding allows the demodulation of the quick paging channel to be performed with a limited amount of demodulation functionality, and therefore with limited additional complexity in the searcher. Also, the use of sample RAM **204** allows multiple time offset demodulation to be performed using a single demodulation engine within searcher **206**, which further reduces the circuitry necessary to monitor for paging messages. (Emphasis added.)

Performing different searches on the same samples allows the RF unit to turn off once the initial set of samples is gathered. Turning off the RF unit reduces the power consumption of the mobile during idle mode. At page 7, lines 12-34, the specification highlights the importance of this feature and discusses that:

In contrast, if the samples were not stored, additional samples would have to be gathered for as long as it was necessary to search for the various pilot signals and time offsets. This continuous gathering of pilot data would require the RF unit to remain on, and therefore consuming power, for a longer period of time, which would reduce the stand-by time of the subscriber unit.

The described embodiments of the invention provide performance enhancements as well as improved idle mode power consumption. In particular, by performing demodulation and searching on the same set of samples, the performance of the demodulation is improved. This is because the best signals as measured by the pilot channel searching will be the best signals for paging channel demodulation because the set of samples are the same. In alternative systems, searching is performed on a first set of samples and the results of that

searching are used to determine how to demodulate paging channels in a second set of samples. While the correspondence between the searching results and paging channel quality is typically reasonable if the time span between the two events is small, any difference in the channel between the search and demodulation is virtually eliminated when compared to fading channel decorrelation time by conducting searching and demodulation on the same samples. (Emphasis added.)

In order to improve efficiency of detecting a page message, in one embodiment of the invention, the mobile station keeps track of several base stations as the best base stations. Fig. 5, page 10, line 29 through page 11, line 24 of the specification discusses this embodiment as follows:

> Referring to **Fig. 5**, pilot signal Ec/Io over time as received by a mobile station is shown. The signals 501-03 are respectively from three different base stations. More base stations could be used. However, for simplicity only three are shown. Each base station transmits a QPCH message 521 to be received by a target mobile station. Note that, at the time of QPCH message 521, the pilot Ec/Io of signal 501 is higher than other pilot Ec/Io levels. Thus, the base station associated with the pilot signal 501 is considered the best base station. The QPCH message 521 basically contains information that a paging message 522 is going to follow for the mobile station. The paging message 522 is followed at a determined time following the QPCH message timing.
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> In a synchronized system, QPCH message 521 may be transmitted by different base stations at substantially the same time. Considering the propagation delay and other factors, QPCH message 521 may also be received at the mobile station substantially at the same time. As a result, the paging message 522 following QCPH message 521 is also transmitted from different base stations at substantially the same time, and received at substantially the same time. Note that, at the time of paging message 522, the base station associated with the pilot signal 501 may not be the best base station. If the mobile station limits the paging message detection to only the best base station as detected during the QPCH 521, the mobile station may fail to properly decode the paging message.
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> In order to solve the problem associated with the changes in the channel between the transmission time of the QPCH message 521 and the paging message 522, the mobile station tracks more than one base station as the best base station. (Emphasis added.)

Art-based Rejections

The Office rejects claims 15-18, 20-28, 30-36, 38-46 and 48-50 under 35 U.S.C. §103(a) as being unpatentable over Bruckert (U.S. Patent No. 5,920,549), Ghosh (U.S. Patent No. 6,018,667, Willey (U.S. Patent No. 6,138,034) and Tiedemann (U.S. Patent No. 6,216,004).

In rejecting claim 33, the Office cites col. 4, lines 49-57 of the Bruckert reference. This section of the Bruckert reference discusses that:

> In another aspect of the invention, the Active Set can include more than one Active Pilot, and the strongest active pilots and neighbor pilots scanned prior to the assigned slot are included in the Active Set prior to the assigned slot. Thus, more than one Paging Channel transmitted from multiple base stations can be simultaneously demodulated, and the likelihood that the wireless communication device will successfully demodulate the paging signal during the assigned slot is improved. (Emphasis added.)

The Office also cites col. 8, lines 33-45 of the Bruckert reference which discusses that:

> If not, logic and control circuit 113 determines if the CRC of the demodulated page message is correct. (Step 221.) If so, the wireless communication device is put to sleep. (Step 217.) If not, logic and control circuit 113 determines if the integrated strength measurement of the composite receive signal (via the RSSI) is greater than a threshold, e.g., thermal noise (no signal) plus 6 decibels. (Step 223.) If not, the wireless communication device is likely to be in an area where signals are weak, and it would be futile to further scan for a strong pilot. Therefore, the wireless communication device is put to sleep. (Step 217.) If the integrated strength measurement of the composite receive signal (via the RSSI) is greater than a threshold, then a final test can be performed. (Emphasis added.)

The Office cites col. 2, lines 10-22 of the Ghosh reference. This section of the Ghosh reference discusses, in part, that:

> It is **desirable to have synchronized base stations for fast acquisition**, yet allow the system to operate in geographic areas where accurate time synchronization is unavailable, or continue to operate when time synchronization fails. (Emphasis added.)

The Office cites col. 1, lines 25-35 of the Willey reference which discloses, in part, that:

> In order to ensure that stored configuration parameter values are up-to-date for mobile stations **monitoring the QPCH paging indicator bits**, the base station, after updating the overhead configuration information, sets all QPCH

paging indicator bits to "ON" for an amount of time which is a function of the maximum slot cycle index. (Emphasis added.)

The Office finally cites col. 3, lines 25+ of the Tiedemann reference which discusses that:

> In at least one earlier CDMA system, for example, **soft handoff can be set up between a mobile unit and two or more base stations in the mobile unit's Active Set**. For instance, in such an earlier CDMA system, when communications are initially established, a mobile unit typically communicates through a first base station, and the Active Set contains only the first base station. The mobile unit monitors the pilot signal strength of the base stations of the Active Set, the Candidate Set, and the Neighbor Set. When a pilot signal of a base station in the Neighbor Set exceeds a predetermined threshold level, the base station is added to the Candidate Set and removed from the Neighbor Set at the mobile unit. The mobile unit communicates a message to the first base station identifying the new base station.(Emphasis added.)

Thus, the Bruckert reference discloses that the Active Set can include more than one Active Pilot, and that more than one Paging Channel transmitted from multiple base stations can be simultaneously demodulated. The Ghosh reference discloses the general concept that it is desirable to have synchronized base stations for fast acquisition. The Willey reference relates to the general concept of a mobile station monitoring the QPCH paging indicator bits. The Tiedemann reference discloses that soft handoff can be set up between a mobile unit and two or more base stations in the mobile unit's Active Set.

In the Office Action dated June 2, 2004, the Office responds to Applicants' arguments filed on March 11, 2004 by stating that:

> "The applicant argues that the references do not simultaneously monitor each of the quick paging channel...' As pointed out above, Bruckertt does show the active set of base stations monitored and demodulated simultaneously. See col. 4, lines 49-57. Furthermore, Tiedemann uses soft handoff that monitors signals from a list of neighboring base stations simultaneously to improve overall SNR."

Applicants respectfully traverse these rejections for at least the following reasons.

1. The cited references, taken alone or in combination, fail to teach or suggest, for example, a terminal that "simultaneously monitors each of the quick paging channels for their respective quick paging channel page messages," as required by claim 33.

Even assuming for the sake of argument that there would be some motivation to combine the four cited references, Applicants submit that the cited references taken in combination would at most teach that soft handoff can be set up between a mobile unit and synchronized base stations in the mobile unit's Active Set (which can include more than one Active Pilot), that more than one Paging Channel transmitted from the base stations can be simultaneously demodulated, and that a mobile station can monitor QPCH paging indicator bits. Applicants submit that the cited references, taken alone or in combination, fail to teach or suggest, for example, a terminal that "simultaneously monitors each of the quick paging channels for their respective quick paging channel page messages," as required by claim 33.

2. The Office has not shown a suggestion or motivation to make the claimed combination.

In addition, Applicants submit that the Office has not shown a suggestion or motivation to make the claimed combination. Applicants submit that there is no reason based on the Bruckert, Ghosh, Willey and Tiedemann references to select the otherwise unrelated elements from these references and combine them in the claimed manner. Applicants submit that the Office has impermissibly used hindsight gleaned from the present application to pick and choose portions of the cited references and reconstruct some portions of the pending claims. For at least this reason, Applicants submit that the Office has shown no motivation to modify/combine that Bruckert reference using teachings from the Ghosh, Willey and Tiedemann references. Because the cited references do not provide any motivation for combining there respective teachings, a terminal that "simultaneously monitors each of the quick paging channels for their respective quick paging channel page messages," would not be obvious based on the cited references. Accordingly, for at least this additional reason, Applicants submit that the rejection of the pending claims is improper and should be withdrawn.

For at least the foregoing reasons, Applicants submit that claim 33 is patentable of over the cited references. In addition, Applicant respectfully submits that dependent claims 34-43 and 46-49 are separately patentable at least by virtue of their dependency from independent claim 33,

and also because those claims recite additional features that are not taught or suggested by the cited references. Applicants submit that claims 15-25, 28-32 and 50 are also patentable for similar reasons.

REQUEST FOR ALLOWANCE

In view of the foregoing, Applicants submit that all pending claims in the application are patentable. Accordingly, reconsideration and allowance of this application are earnestly solicited. Should any issues remain unresolved, the Examiner is encouraged to telephone the undersigned at the number provided below.

Respectfully submitted,

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